

Scotch Education Department, Prof. Sadler's report on secondary education in Liverpool, and other publications. Men of science would do well to note what is given as the sum and substance of official activity in education since the passing of the recent Education Act. The writer says, "If we were asked to describe in one word the whole tendency of English education as manifested at the present time, we should speak of a humanistic renaissance." And again later, "English education, we believe, is working round to the humanistic ideal." Literary studies are included in every satisfactory scheme of elementary and secondary education, and the man of science recognises fully the value of the humanities in the work of schools and colleges. But whatever "humanistic renaissance" there may be dawning upon the world of education, it is to be hoped that the danger of a return to the conditions of fifty years ago, when instruction in the methods of science was unknown in our schools, and no opportunity to become acquainted with natural objects was offered, will be borne in mind by all education committees and other authorities.

THE Hon. Maude Lawrence has been appointed to a newly-established post of Chief Woman Inspector under the Board of Education. Miss Lawrence will direct a staff of women inspectors of special qualifications and varied experience, who will assist the Board in dealing with many questions for the treatment of which they have hitherto been somewhat imperfectly equipped. Instruction in various domestic subjects, such as needlework, cookery, laundry work, household management, and hygiene, has for some time past been given under the regulations of the Board for schools of different grades. But the report of the Inter-Departmental Committee on Physical Deterioration points to the need of a reform in the methods now commonly employed in the teaching of these subjects. It is considered that this instruction has been less effective than it should have been, because it has been too theoretical and has not been kept sufficiently in touch with the needs and habits of daily life. The new branch of the inspectorate will be employed to assist local authorities in providing, as part of their educational system, ample opportunities for girls of various ages to obtain a training for home life simple, practical, and adapted, where necessary, to the special circumstances of each locality. There are also many questions of importance involving the national physique, as affected by the studies, the life, and the treatment of children, and especially of very young children, from day to day in elementary schools, which women inspectors are specially qualified to investigate and to advise upon.

THE council of the Association of Technical Institutions has published its report of an inquiry, undertaken in May, 1904, as to the conditions of admission to evening classes in technical institutions and evening continuation schools throughout the country. The council considers that the returns and expert opinions recorded in this report justify the following conclusions:—(1) That it is undesirable to establish any general system of free admission to evening continuation schools, or of free admission or admission at specially reduced fees to evening classes in technical institutions. (2) That it is unnecessary to grant entirely free admission, to evening classes in technical institutions, to any special class or body of students or workers engaged in skilled industries, such as apprentices or persons under twenty-one years of age. (3) That there is need for the establishment in all technical institutions of sufficient "free studentships" or "scholarships" to secure the admission of all qualified and deserving students who are unable, by reason of their limited means, to pay the usual class fees without more sacrifice than should reasonably be expected of them. The plan to secure information adopted by the council was to issue a letter and form of inquiry to the education authorities and technical institutions throughout the United Kingdom asking for information as to the existence of the following conditions of admission to evening classes: (a) entirely free, (b) at less than normal fee, (c) by scholarships, (d) by arrangement with employers. Replies were received with reference to sixty evening continuation school areas and from eighty-three technical institutions. Of the technical institutions, fifty-five are not

in favour of free admission, and one only in favour of it. The remaining institutions gave no definite answer. Thirty-eight education committees are against free admission to evening continuation schools, two are in favour of it, sixteen expressed no opinion, and four suggest scholarships.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 24, 1904.—"The Flow of Water through Pipes.—Experiments on Stream-line Motion and the Measurement of Critical Velocity." By Dr. H. T. Barnes and Dr. E. G. Coker. Communicated by Prof. Osborne Reynolds, F.R.S.

In a brief note published in the *Physical Review* (vol. xii. p. 372, 1901), the authors described a thermal method of observing the change from stream-line to eddy motion for water flowing through pipes of different diameters.

The impossibility of heating a column of water uniformly throughout while flowing in stream-line motion has been previously observed. It was shown that, when water is heated electrically while flowing through a tube of two or three millimetres diameter by a central wire conductor, the heat is carried off by the rapidly moving stream, which forms a cloak of hot water around the wire, and leaves the walls of the tube almost entirely unheated.

The change from stream-line to eddy motion can be very clearly observed in a tube heated on the outside, since the temperature of the emerging stream immediately increases when the flow rises above the critical point. The point of change is very sharp, and the disappearance of the stream-lines instantaneous.

It is clear from a study of the work of Osborne Reynolds that the change from stream-line to eddy motion may take place within a wide range of velocities. Critical velocity is measured in two ways: either by observing the velocity at which the stream-lines break up into eddies, or by obtaining the velocity at which the eddies from initially disturbed water do not become smoothed out into stream-lines in a long uniform pipe. The first change may be at any velocity within certain limits depending on the initial steadiness of the inflowing water, while in the second, the change can take place at only one velocity.

Osborne Reynolds's experiments were carried out by the method of colour bands in a long rectangular tank. By using a very much larger tank under a high head of water the authors were able to obtain a higher degree of steadiness than was obtained in the comparatively small tank used by Reynolds. A large number of experiments were obtained, an account of which forms the main part of the present paper.

Briefly, the result of the work may be summarised as follows:—

- (1) The attainment of exceedingly high velocities of stream-line flow for certain sizes of pipes fed by perfectly quiet water under a high head.
- (2) The re-formation of stream-lines in certain cases after eddies had formed, with a subsequent breaking up of the stream-lines at a very much higher velocity.
- (3) A small divergence from the law of the change in viscosity with temperature for the upper-limit of stream-line flow.
- (4) A verification of the viscosity temperature law for the lower-limit of stream-line flow by separate methods.

January 19.—"Further Histological Studies on the Localisation of Cerebral Function.—The Brains of Felis, Canis, and Sus compared with that of Homo." By Dr. A. W. Campbell. Communicated by Prof. Sherrington, F.R.S.

This addendum to a work on cerebral localisation, presented by the same author to the Royal Society in November, 1903, aims at elucidating certain obscure functional analogies and structural homologies pertaining to the brain.

The points emphasised are as follows:—Giant cells characterise the cortex of the lower mammalian cruciate zone, and this represents the motor area, as defined by Profs. Sherrington and Grünbaum in the anthropoid ape,

and by the author in man. The compensatory ansate and coronal sulci are respectively interchangeable with the upper and lower constituents of the primate fissure of Rolando. The common sensory area forms a morphological buffer behind the cruciate zone. Quite one-sixth of the lower animal's brain surface is allotted to visual cortex. The "true calcarine" fissure is the antecedent of the human anterior calcarine, the intercalary sulcus undergoes retrograde changes, and the suprasplenial sulcus is the derivative of the "sulcus intrastriatus lateralis." In the limbic region, human types of cortex are repeated, and the genual fissure is the homologue of the calloso-marginal. Parietal cortex is older, in the sense of phylogeny, than frontal. The lateral sulcus is the forerunner of the intraparietal. Out of the ectosylvian region of lower animals is developed the Sylvian region, including the insula, and much of the temporal lobe of primates.

It is concluded that the stability of the architectural plan of any given field of cortex is directly related to the phylogenic age of that cortex, and to the importance, as a means to survival, of the function it subserves; and, that while the human brain has expanded more decisively in some parts than in others, yet that expansion, if we except the visual and olfactory areas, has been general in kind.

January 26.—"On a Method of Finding the Conductivity for Heat." By Prof. C. Niven, F.R.S.

The first part of the paper contains a detailed account of the methods employed for finding the difference of temperature, and a description of the apparatus used. The results of some experiments made with it are also given, and compared with those found by other observers. The second part of the paper contains a solution of the mathematical problem of the diffusion of heat in an infinite solid from a line at which it is supplied at a constant rate, and the solution of some other allied questions. One result of the investigation suggests a method of finding the diffusivity directly, when the substance is of sufficiently great extent.

"The Boring of the Simplon Tunnel, and the Distribution of Temperature that was encountered." By Francis Fox. Communicated by C. V. Boys, F.R.S.

February 2.—"On the Compressibility of Gases between One Atmosphere and Half an Atmosphere of Pressure." By Lord Rayleigh, O.M., F.R.S.

The present memoir contains a detailed account of the observations referred to in the Preliminary Notice of February, 1904. In addition, results are now given for air, carbonic anhydride, and nitrous oxide. In the following table are recorded the values of B for the various gases at specified temperatures, B denoting the quotient of the value of p_v at half an atmosphere by the value at the whole atmosphere:—

Gas	B	Temperature
Oxygen	1.00038	... 11.2
Hydrogen	0.99974	... 10.7
Nitrogen	1.00015	... 14.9
Carbonic oxide	1.00026	... 13.8
Air	1.00023	... 11.4
Carbon dioxide	1.00279	... 15.0
Nitrous oxide	1.00327	... 11.0

By means of a formula given by D. Berthelot the compressibilities at 0° C. are inferred, and applied to deduce the ratio of densities as they would be observed at 0° C. under very low pressures. According to Avogadro's law these are the relative molecular weights. From the densities of nitrogen and oxygen we get $N = 14.008$, if $O = 16$. Again, from the densities of oxygen and nitrous oxide we find $N = 13.998$. The former is probably the more trustworthy.

Chemical Society, January 18.—Prof. W. A. Tilden, F.R.S., president, in the chair.—Nitrogen halogen derivatives of the sulphonamides: F. D. Chattaway. A number of the nitrogen halogen derivatives of the sulphonamides, which are obtained by the action of hypochlorous acid on the sulphonamides and the alkylsulphonamides, were described, and the ease with which they can be prepared and crystallised demonstrated.—Electrolytic oxidation of the aliphatic aldehydes: H. D. Law. The chief product of oxidation of the lower members of the saturated aliphatic

aldehydes is the corresponding organic acid, but small quantities of carbon dioxide and monoxide and saturated hydrocarbons are also formed in some cases.—The diazo-derivatives of the benzenesulphonylphenylenediamines: G. T. Morgan and F. M. G. Micklethwait. A description is given of the substances produced by the interaction of nitrous acid with the benzenesulphonyl derivatives of *o*-, *m*- and *p*-phenylenediamines, illustrating the different behaviour of these isomerides with this reagent.—The molecular condition in solution of ferrous potassium oxalate: S. E. Sheppard and C. E. K. Mees. Ferrous oxalate was shown to dissolve in alkali oxalates forming double salts, such as $K_2Fe(C_2O_4)_2$, which dissociate accord-

ing to the scheme $2K^+ + Fe(C_2O_4)_2^{2-}$. Spectrophotometric measurements indicated that the formation of ferrous ions at moderate dilutions was negligibly small.—A further analogy between the asymmetric nitrogen and carbon atoms: H. O. Jones. The author showed that, during the formation of an asymmetric nitrogen atom in a compound containing an asymmetric carbon atom, two isomerides, which are called the α - and β -compounds, are produced. For this purpose methyl-*l*-amylaniline has been combined with allyl and benzyl iodides.—The formation of magnesia from magnesium carbonate by heat and the effect of temperature on the properties of the product: W. C. Anderson. Experiments were made with native and artificial magnesium carbonates to ascertain (1) the lowest temperature at which the evolution of carbon dioxide could be distinctly recognised; (2) the comparative rates at which the expulsion of the gas takes place at higher temperatures under atmospheric pressure; and (3) the extent to which the magnesia obtained dissolves in water after being kept at different known temperatures for a fixed period. It is inferred from the results that polymerisation takes place when magnesia is heated, and that this goes on more quickly in the "heavy" oxide than in "light" magnesia.—Transformations of derivatives of *s*-tribromodiazobenzenes: K. J. P. Orton.—The addition of sodium hydrogen sulphite to ketonic compounds: A. W. Stewart.—The reduction products of anisic acid: J. S. Lumsden. When anisic acid, dissolved in amyl alcohol, is reduced by sodium, the products are hexahydrobenzoic acid and δ -keto-hexahydrobenzoic acid.—The physical properties of heptoic, hexahydrobenzoic, and benzoic acids and their derivatives: J. S. Lumsden.—The influence of solvents on the rotation of optically active compounds. Part vii. Solution-volume and rotation of menthol and menthyl tartrates: T. S. Patterson and F. Taylor.

Royal Microscopical Society, January 18.—Dr. Dukinfield H. Scott, F.R.S., president, in the chair.—The President delivered his annual address, the subject of which was an inquiry as to "What were the Carboniferous Ferns?"

Geological Society, January 18.—Dr. J. E. Marr, F.R.S., president, in the chair.—On the geology of Arenig Fawr and Moel Llyfnant: W. G. Fearnside. This paper contains a detailed description of the succession of beds in Sedgwick's typical area of development of his Arenig series. The author discusses the relationship of the various divisions he describes to corresponding beds of other areas. He gives a description of the intrusive igneous rocks, and some account of the structure of the district and the nature of its glaciation.

Physical Society, January 27.—Dr. R. T. Glazebrook, F.R.S., president, in the chair.—Action of a magnetic field on the discharge through a gas: Dr. R. S. Willows. It has been shown previously that a transverse magnetic field, if applied at the cathode, may in some cases reduce the potential difference at the terminals of the tube. It is shown in the paper that the pressure at which this decrease commences corresponds to the pressure at which the voltage required to maintain this discharge, under normal conditions, is a minimum. This is also found to be the pressure at which the positive column is first completely striated. Reasons why such action takes place are given.—Action of radium on the electric spark: Dr. R. S. Willows and J. Peck. In certain cases the authors have found that the spark from a Wimshurst machine is extinguished by the action of the radiations from radium and that the current

passing is decreased. The action is altogether different according to the direction of the discharge. Using a spark-gap longer than 2 cm. and making the larger knob, of the machine used, positive, the radiations had practically no influence. With the smaller knob positive the radium, in most cases, extinguished the spark. The phenomenon is found to be due to the action of the β rays. Röntgen rays do not produce this effect, even if their ionising power at the spark-gap is some thousands of times greater than that of the radium. Lenard rays are, however, effective.—The slow stretch in indiarubber, glass, and metal wires subjected to a constant pull: P. **Phillips**. When indiarubber is subjected to a sustained pull of constant amount it yields at quite a large rate, the stretch at any time (t), after the establishment of the pull, being given by $x = a + b \log t$, a and b being constants for the particular pull exerted. For different pulls b is proportional to the pull. When the pull is removed the indiarubber slowly returns to its original length, the extension still remaining at a time t_0 after the removal being given by

$$x = b \log (t/t_0),$$

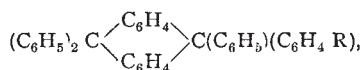
t being the time which has elapsed since the pull was established. These two results, for the slow stretching and slow recovery of indiarubber, have also been established for glass fibres subjected to sustained pull, but the magnitude of the slow yielding is very much smaller. When annealed wires of copper, silver, gold, or platinum are subjected to a sustained pull they behave in some ways similarly to indiarubber and glass, but there are some very decided differences. If the pull is greater than a certain amount (in the actual experiments about one-third to one-quarter of the breaking weight) the stretch at any time (t) after the establishment of the pull is given by the same law $x = a + b \log t$, but below this value of the pull b is zero. This law obtains up to the breaking strain of the wire, b increasing very rapidly a little before the breaking strain is reached. When the pull is removed, there is no appreciable slow recovery like that occurring in indiarubber and glass. Iron and steel wires show themselves to be exceptions to these rules.—Determination of Young's modulus (adiabatic) for glass: C. A. **Bell**, with an appendix by Dr. C. **Chree**, F.R.S. In this paper it is shown that errors in the acoustical determination of Young's modulus for glass, due to irregularities in the rods or tubes employed, may be eliminated by applying to the measured length of each free-free rod a correction given by the formula

$$\Delta l = \int_0^l \frac{\delta S}{S_0} \cos \frac{2\pi z}{l} dz,$$

in which δS is the difference between the cross section at the point z and its mean value, S_0 , for the whole rod.—Some methods for studying the viscosity of solids: Dr. **Boris Weinberg**. The author has been carrying out investigations similar to those described by Prof. Trouton and Mr. Andrews in their paper on the viscosity of pitch-like substances (*Proc. Phys. Soc.*, 1903). The details of his experiments are, however, different. He has worked principally with lead and has employed three distinct methods for determining the coefficient of viscosity.

PARIS.

Academy of Sciences, January 30.—M. Troost in the chair.—On some new experiments relating to the preparation of the diamond: Henri **Moissan**. In connection with the study of the Cañon Diablo meteorite, it appeared desirable to repeat the experiments on the formation of diamonds in rapidly cooled cast iron, with especial reference to the effect of sulphur and silicon in the ingot. The results obtained with an ingot to which iron sulphide had been added immediately before cooling were similar to those of the earlier experiments, except that the yield of diamonds was slightly greater. The addition of silicon had the same effect, except that the formation of the dense silicon carbide rendered the separation of the microscopic diamonds rather more difficult. Drawings of four typical crystals are given.—Synthesis in the anthracene series: MM. **Haller** and A. **Guyot**. γ -hydroxy- γ -triphenyl-dihydroanthracene condenses very readily with amines and phenols, giving compounds of the type



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in which R may be $\text{N}(\text{CH}_3)_2$, $\text{N}(\text{C}_2\text{H}_5)_2$, NH_2 , or OH . A description of these substances is given.—The mixed treatment of trypanosomiasis by arsenious acid and trypan-red: A. **Laveran**. The injection of these substances has caused the disappearance of the *Tr. gambiense* in certain animals, and hence the author regards this disease as curable in certain cases, the most efficacious treatment being the successive injection of arsenious acid and trypan-red. As the curative doses of these substances are not far removed from their toxic doses, this toxicity being variable with the animal species, the doses to be prescribed must be rigorously determined. This will be especially difficult for man.—On the faculty possessed by cement strengthened with iron of supporting large elongations: M. **Considere**. Some doubt having been thrown on the earlier work of the author on this subject by German and American writers, details are given of some further experiments, the results of which are in complete accordance with those of the earlier work.—On the new short period comet 1904 e (Borrelly, December 28, 1904): G. **Fayet**. Observations on this comet having now been carried on for a month, the calculation of its orbit can be made with more certainty. The results confirm those previously published, the time of revolution being now determined at about seven years.—A secondary shadow observed on the rings of Saturn in October, November, and December, 1904: M. **Amann** and Cl. **Rozet**. Between October 20 and the end of December, besides the shadow of Saturn projected on its ring a second shadow, narrower and less well marked than this, was observed. It traversed the rings throughout in the form of a curved line, and it was noted that the portion of the rings between the shadow of the planet and that now described appeared to be more brilliant than the other illuminated portions of the rings. It is not clear to what this extra shadow can be due.—Remarks on a generalisation of M. Riesz: Émile **Borel**.—On the zeros of integral functions of infinite order, not transfinite: Ed. **Maillet**.—On the precision of geographical positions obtained in the field with the prism astrolabe: M. **Driencourt**. This instrument, invented by A. Claude, has already been tested in the Observatory of Montsouris, with very satisfactory results; it remained to be seen whether the same accuracy could be maintained in field observations. Details are given of some measurements made in Madagascar showing the remarkable saving of time, without loss of precision, resulting from its use.—On the self-registration of the ions of the atmosphere: P. **Langevin** and M. **Moulin**. Owing to the existence of two kinds of ions in air differing greatly in mobility, it is not possible to register these on the same apparatus, although the same principle is applicable. The theory of the apparatus with some details of its construction are given.—On the tempering of bronzes: Léon **Guillet**. The mechanical properties of bronzes of varying content of copper, and after tempering at varying temperatures, correspond very closely with the changes of constitution brought out by the experiments of Heycock and Neville.—A brown modification of colloidal ferric oxide: P. **Nicolardot**.—On the chlorination of methyl-ethyl-ketone: André **Kling**. After trying the various methods of chlorination of ketones, the method found to give the best yield is described in detail, the action of chlorine in the presence of water and marble. The chief product was $\text{CH}_3\text{CHCl.CO.CH}_3$, boiling at 114° to 117° , and furnishing the glycol $\text{CH}_3\text{CH(OH).CH(OH).CH}_3$ on reduction.—The action of dilute nitric acid upon vegetable fibres: M. **Jardin**. The use of a weak solution of nitric acid, 5 parts of acid in 1000, is suggested for bleaching flax. It presents certain advantages in regard to the time and the amount of labour required, and leaves a fibre which takes the dye in a perfectly homogeneous manner.—On fiedlerite: A. **de Schulten**. This mineral is a hydrated oxychloride of lead, of a composition corresponding to 2PbOHCl.PbCl_2 .—On the salts of the Tchad region: H. **Courtet**.—On the parasitism of *Osyris alba*: A. **Fraysee**. In a preceding note some conclusions have been given on the biology of *Osyris alba* and on the anatomy of its suckers. In the present note is an account of the general physiology of these suckers and the relations existing between the parasite and its host.—On the changes of composition of the fruit of the Cucurbitaceæ: **Leclerc du Sablon**.—On the chemical composition and the significance

tion of the aleurone grains: S. Posternak. The analyses of aleurone grains obtained from four different species of plants showed practically the same composition, noteworthy points being the invariable presence of silicon and the absence of sodium and chlorine. The manganese was more variable in amount than the other elements.—The preparation of practically sterile musts from apples: G. Perrier.—The mode of dorsal fixation of *Lernaenicus Sardinae* on its host: Marcel Baudouin.—The existence of intra-uterine rickets: MM. Charrin and Le Play.—On the folded layers near Saint-Jean-de-Buèges (Hérault): René Nicklès.—On the ascents of captive balloons carried out on the Mediterranean and on the Atlantic Ocean from the yacht of the Prince of Monaco in 1904: H. Hergesell. A study of the atmospheric conditions above the ocean, measurements being taken of the temperature, relative humidity, and direction of the wind at varying heights above the sea level.—On the existence of high terraces in the North Ural: L. Duparc and F. Pearce.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 9.

ROYAL SOCIETY, at 4.30.—(1) On the Conversion of Electric Oscillations into Continuous Currents by means of a Vacuum Valve: (2) On an Instrument for the Measurement of the Length of Long Electric Waves, and also small Inductances and Capacities: Prof. J. A. Fleming, F.R.S.—Report on an Area of Local Magnetic Disturbance in East Loch Roag, Lewis, Hebrides: Captain A. M. Field, R.N.—Phosphorescence caused by the Beta and Gamma Rays of Radium: G. T. Beilby.—(1) The Spectrum of Scandium and its Relation to Celestial Spectra: (2) On the Stellar Line near $\lambda 4686$: (3) Note on the Spectrum of μ Centauri: Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall.—Europium and its Ultra-Violet Spectrum: Sir William Crookes, F.R.S.

ROYAL INSTITUTION, at 5.—Forestry in the British Empire: Prof. W. Schlich, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Fuel Economy in Steam Power Plants: W. H. Booth and J. B. C. Kershaw. (Conclusion of discussion.)—The Value of Overhead Mains for Electric Distribution in the United Kingdom: G. L. Addenbrooke.

MATHEMATICAL SOCIETY, at 5.30.—General Theory of Transfinite Numbers and Order-types: Dr. E. W. Hobson.—On the Reducibility of Covariants of Binary Quantics of Infinite Order. Part ii: Mr. P. W. Wood.

FRIDAY, FEBRUARY 10.

ROYAL INSTITUTION, at 9.—The Art of the Ionian Greeks: Dr. Cecil Smith.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Anniversary Meeting.

MALACOLOGICAL SOCIETY.—Annual General Meeting. Address by the President, Mr. E. R. Sykes, on Variation (including Teratology) in Recent Mollusca.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Reconstruction of the Santa Lucia River Bridge, Uruguay: P. J. Risdon.

PHYSICAL SOCIETY, at 8.—Address on Radiation Pressure by the President-elect, Prof. J. H. Poynting, F.R.S.

MONDAY, FEBRUARY 13.

SOCIETY OF ARTS, at 8.—Internal Combustion Engines: Dugald Clerk.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—The Geographical Results of the Tibet Mission: Sir Frank Younghusband, K.C.I.E.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Results of Force Measurements with Cutting Tools, and their Application to Lathe Design: Dr. J. T. Nicolson.

TUESDAY, FEBRUARY 14.

ROYAL INSTITUTION, at 5.—The Structure and Life of Animals: Prof. L. C. Miall, F.R.S.

SOCIOLOGICAL SOCIETY, at 4.—(1) Restrictions in Marriage: (2) Studies in National Eugenics: Communicated by Dr. Francis Galton, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Alfred Second Tunnel: E. F. C. Trench.—The Reconstruction of Moncreiffe Tunnel: D. McLellan.

ANTHROPOLOGICAL INSTITUTE, at 8.15.—Kinematograph Exhibition of Native Dances from Torres Straits: Dr. A. C. Haddon, F.R.S.—The Dog-motive in Bornean Art: E. B. Haddon.

WEDNESDAY, FEBRUARY 15.

SOCIETY OF ARTS, at 8.—The Decline of the Country Town: Arthur H. Anderson.

ROYAL MICROSCOPICAL SOCIETY, at 8.—Practical Micro-Metallography with Experimental Demonstration: J. E. Stead, F.R.S.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Report on the Phenological Observations for 1904: E. Mawley.—Observations made during a Balloon Ascent at Berlin, September 1, 1904: Dr. Hermann Elias and J. H. Field.—The Winds of East London, Cape Colony: J. R. Sutton.

CHEMICAL SOCIETY, at 5.30.—The Condensation of Anilino-acetic Esters in Presence of Sodium Alcoholate: A. T. de Moulpied.—Nitrogen Halogen Derivatives of the Aliphatic Diamines: F. D. Chattaway.—Nitration of Substituted Azophenols: J. T. Hewitt and H. V. Mitchell.

THURSDAY, FEBRUARY 16.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Polarised Röntgen Radiation: Dr. G. C. Barkla.—The Effects of Momentary Stresses in Metals: Prof. B. Hopkinson.—The Halogen Hydrides as Conducting Solvents. Part I. The Vapour Pressures, Densities, Surface Energies, and Viscosities of the Pure Solvents: D. McIntosh and B. D. Steele.—The Halogen Hydrides as Conducting Solvents. Part II. The Conductivity and Molecular Weights of Dissolved Substances: D. McIntosh and E. H. Archibald.—The Halogen Hydrides as Conducting Solvents. Part III. The Transport Numbers of Certain Dissolved Substances: B. D. Steele.—The Halogen Hydrides as Conducting Solvents. Part IV: B. D. Steele, D. McIntosh, and E. H. Archibald.

ROYAL INSTITUTION, at 5.—Recent Work of the Geological Survey: Prof. J. J. H. Teall, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Indian Census of 1901: Sir Charles A. Elliott, K.C.S.I.

LINNEAN SOCIETY, at 8.—A Revised Classification of Roses: J. G. Baker, F.R.S.—The Botany of the Anglo-German Uganda Boundary Commission: E. G. Baker, Spencer Moore, and Dr. A. B. Rendle.

FRIDAY, FEBRUARY 17.

ROYAL INSTITUTION, at 9.—High Power Microscopy: John W. Gordon.

GEOLOGICAL SOCIETY, at 8.—Anniversary Meeting.

EPIDEMIOLOGICAL SOCIETY, at 8.30.—The Protozoa in Relation to Disease: Prof. E. J. McWeeney.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Annual General Meeting.—Adjourned Discussion on the American Visit, 1904.—The Strength of Columns: Prof. W. E. Lilly.

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